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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,836	03/24/2004	Leonel R. Arana	ITL.1133US (P19113)	4329

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EXAMINER	
DOTY, HEATHER ANNE	

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/807,836	ARANA ET AL.	
	Examiner	Art Unit	
	Heather A. Doty	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16,18-24,26 and 27* is/are rejected.

7)☒ Claim(s) *17 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/12/04,8/08/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless – (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Najafi et al. (U.S. 6,140,144).

Regarding claim 1, Najafi et al. teaches a method comprising microfabricating a vacuum sensor (**1** in Fig. 7D; claim 58—pressure sensor); and enclosing said vacuum sensor with an integrated circuit inside an enclosure (**22** in Fig. 7D; column 10, lines 40-43).

Regarding claims 2 and 3, Najafi et al. teaches the method of claim 1, and further teaches integrating said vacuum sensor and said integrated circuit in the same substrate, or integrating said vacuum sensor and said integrated circuit on separate dice and enclosing said separate dice in the same enclosure (column 10, lines 40-43).

Regarding claim 10, Najafi et al. teaches an integrated circuit device comprising a microfabricated vacuum sensor (**1** in Fig. 7D; claim 58—pressure sensor); an integrated circuit (not pictured—column 10, lines 40-43); an enclosure (**22** in Fig. 7D); and a substrate (2 in Fig. 7D), said enclosure mounted on said substrate and enclosing both said vacuum sensor and said circuit within said enclosure (see Fig. 7D).

Regarding claims 11 and 12, Najafi et al. teaches the device of claim 10, and further teaches that the vacuum sensor and said integrated circuit are monolithically

integrated in the same die, or that the vacuum sensor and integrated circuit are on separate dice (column 10, lines 40-43).

Claims 1, 2, 8-11, 18-20, 26, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Staller (U.S. 6,074,891).

Regarding claim 1, Staller teaches a method comprising microfabricating a vacuum sensor (**14** in Fig. 1; column 3, lines 16-20—pressure sensor); and enclosing said vacuum sensor with an integrated circuit (PN junction diode **20** in Fig. 1; column 3, lines 36-40) inside an enclosure (**12**, **18** in Fig. 1).

Regarding claim 2, Staller teaches the method of claim 1, and further teaches including integrating said vacuum sensor and said integrated circuit in the same substrate (device wafer **10** in Fig. 1).

Regarding claim 8, Staller teaches the method of claim 1, and further teaches providing an enclosure that covers said vacuum sensor and said integrated circuit and provides a hermetically sealed chamber (column 3, lines 36-40).

Regarding claim 9, Staller teaches the method of claim 8, and further teaches providing an electrical connection under said enclosure to the exterior of said chamber (conductive runners **22** in Fig. 2).

Regarding claim 10, Staller teaches an integrated circuit device comprising a microfabricated vacuum sensor (**14** in Fig. 1; column 3, lines 16-20—pressure sensor); an integrated circuit (PN junction diode **20** in Fig. 1; column 3, lines 36-40); an enclosure (**12**, **18** in Fig. 1); and a substrate (device wafer **10** in Fig. 1), said enclosure

mounted on said substrate and enclosing both said vacuum sensor and said circuit within said enclosure (see Fig. 1).

Regarding claim 11, Staller teaches the device of claim 10, and further teaches that the vacuum sensor and the integrated circuit are monolithically integrated in the same die (device wafer **10**).

Regarding claim 18, Staller teaches the device of claim 10, and further teaches that the enclosure is hermetically sealed (column 3, lines 36-40).

Regarding claim 19, Staller teaches the device of claim 18, and further teaches including an electrical connection extending under the enclosure to the exterior of the enclosure (conductive runners **22** in Fig. 2).

Regarding claim 20, Staller teaches an integrated circuit device comprising a substrate (device wafer 10); a vacuum sensor integrated in said substrate (**14** in Fig. 1; column 3, lines 16-20—pressure sensor); an integrated circuit integrated in said substrate ((PN junction diode **20** in Fig. 1; column 3, lines 36-40); and an enclosure (**12**, **18** in Fig. 1), said enclosure mounted on said substrate and enclosing both said vacuum sensor and said integrated circuit within said enclosure (see Fig. 1).

Regarding claim 26, Staller teaches the device of claim 20, and further teaches that the enclosure is hermetically sealed (column 3, lines 36-40).

Regarding claim 27, Staller teaches the device of claim 26, and further teaches including an electrical connection extending under the enclosure to the exterior of the enclosure (conductive runners **22** in Fig. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-6, 13-15, and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staller (U.S. 6,074,891) in view of Kishi et al. (JP 2001-324403).

Regarding claims 4-6, 13-15, and 21-23, Staller teaches the method of claim 1 and the devices of claims 10 and 20 (note 35 U.S.C. 102(b) rejection above), but is silent regarding the specific nature of the vacuum sensor, and therefore does not teach including microfabricating the vacuum sensor as a serpentine wire, microfabricating the vacuum sensor as a suspended serpentine wire, or forming a contact on a surface, said contact coupled to said wire.

Kishi et al. teaches forming a vacuum sensor as a suspended—further limited by claims 5, 14, and 22—serpentine wire—further limited by claims 4, 13, and 21—(**2** in drawings 1 and 2) with contacts (**5a** and **5b** in drawing 1) coupled to said wire—further limited by claims 6, 15, and 23. The vacuum sensor taught by Kishi et al. is small and capable of being mass-produced stably (abstract).

Therefore, at the time of the invention, it would have been obvious to incorporate the vacuum sensor taught by Kishi et al. into the invention taught by Staller, and taught by claims 1, 10, and 20, because the sensor taught by Kishi et al. is small and capable of being mass-produced stably, as expressly taught by Kishi et al.

Claims 7, 16, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staller (U.S. 6,074,891) in view of Kishi et al. (JP 2001-324403) as applied to claims 4-6, 13-15, and 21-23 above, and further in view of Kawamura (U.S. 2002/0105045).

Regarding claims 7, 16, and 24, Staller and Kishi et al. together teach the method of claim 6 and the device of claims 15 and 23 (note 35 U.S.C. 103(a) rejection above), but do not teach that the contact is u-shaped.

Kawamura teaches a thermistor element (**6** in Fig. 3) having two u-shaped contacts (**4a** and **5a** in Fig. 2). The shape of these contacts allows them to have a low thermal conductivity (paragraph 0021).

Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to fabricate the device taught by Staller and Kishi et al. together, and also taught by claims 15 and 23, using the method taught by Staller and Kishi et al. together, and also taught by claim 6, and further make the contact u-shaped, as taught by Kawamura. The motivation for doing so at the time of the invention would have been to incorporate electrical contacts with low thermal conductivity, as expressly taught by Kawamura.

Allowable Subject Matter

Claim 17 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 17 and 25, prior art does not teach or suggest, in combination with the other claimed limitations, a vertical portion extending upwardly between a contact and a suspended wire sensor. Kishi et al. teaches a vacuum sensor comprising a suspended serpentine wire with contacts on top of the wire. The suspended wire is fabricated from silicon by etching away material beneath the wire and forming a ditch (drawing 4). Therefore, no vertical portion extends upwardly from the contact to the wire. Kawamura teaches a thermistor sensor directly deposited on the contacts, with no intervening vertical portion. There is no motivation to combine other relevant prior art with either of these references to arrive at a sensor including a vertical portion extending upwardly from a contact to a suspended wire.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather A. Doty, whose telephone number is 571-272-8429. The examiner can normally be reached on M-F, 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

had

CARL WHITEHEAD, JR.
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